

# Claims

[c1] What is claimed is:

1. A method of registering the position of a ribbon by moving the ribbon with a constant angular velocity and detecting the amount of the ribbon used in a photo printer, the ribbon comprising a plurality of separation regions, a plurality of dye regions each having a plurality of dye frames, and a plurality of separation frames for dividing the dye frames;  
the printer comprising:  
a print head for transferring dye on the ribbon onto a media;  
a ribbon-driving device for moving the ribbon in a pre-determined direction with a constant angular velocity and for accommodating the ribbon; and  
a photo sensor, set besides the ribbon, for generating a corresponding sensing signal; wherein the sensing signal has a first status and a second status;  
the method comprising:  
detecting a length of time of the first status when the sensing signal changes its status from the second status to the first status;  
determining an amount of ribbon used based on the

length of time of the first status, if the length of time of the first status is shorter than a threshold, the first dye frame of the dye region is registered;  
determining a required moving time for the ribbon to register a start position of a subsequent dye frame of the dye region based on the length of time of the first status used to register the first dye frame of a dye region, a total length of the printed part of the dye frame, and a length from non-printed part of the dye frame to the subsequent dye frame, while one of the dye frames of the dye region is finished printing.

[c2] 2. The method of claim 1, wherein the ribbon driving device comprises a take-up spool and a supply spool, both for taping the ribbon; wherein determining the amount of ribbon used is based on the length of time of the first status if the length of time of the first status is shorter than the threshold, a length of the dye region, a length of the separation region between the two adjacent dye regions, a thickness of the ribbon, a radius of the take-up spool, and a rotation speed of the take-up spool and the supply spool.

[c3] 3. The method of claim 1, wherein the printer further comprises a light source for emitting light toward the plurality of dye frames of the ribbon, and the photo sensor generates sensing signals when sensing a beam from

the light source passes through the dye frames.

- [c4] 4. The method of claim 1, wherein a separation region is placed in front of each dye frame.
- [c5] 5. The method of claim 1, wherein the first status is a low level voltage status, and the second status is a high level voltage status.
- [c6] 6. The method of claim 1, wherein each dye region comprises a yellow dye frame, a magenta dye frame, a cyan dye frame, an over-coating dye frame, the separation region prior to the yellow dye frame being a black bar region, the separation regions prior to other dye frames being transparent separation regions.
- [c7] 7. The method of claim 6, wherein each dye frame is much longer than both the black bar region and the transparent separation regions.
- [c8] 8. The method of claim 6, wherein the light source is a green light LED, and wherein when the green light LED emits green light to illuminate the yellow dye frame, the over-coating dye frame, and the transparent separation region, the sensing signal is in the second status; when the green light LED emits green light to illuminate the magenta dye frame, the cyan dye frame, and the black bar region, the sensing signal is in the first status.

- [c9] 9. The method of claim 6, wherein the light source is a red light LED, and wherein when the red light LED emits red light to illuminate the yellow dye frame, the magenta dye frame, the over-coating dye frame, and the transparent separation region, the sensing signal is in the second status; when the red light LED emits red light to illuminate the cyan dye frame, and the black bar region, the sensing signal is in the first status.
- [c10] 10. The method of claim 6, wherein the light source can be any LED for emitting various color light, and wherein when the LED emits light to illuminate the yellow dye frame, the over-coating dye frame, and the transparent separation region, the sensing signal is in the second status; when the LED emits light to illuminate the black bar region, the sensing signal is in the first status; when the LED emits light to illuminate the magenta dye frame, and the cyan dye frame, the sensing signal can be in the first status or the second status.
- [c11] 11. A device for performing the method of claim 1.